What is claimed is:

[Claim 1] 1. A method of decomposing a complex distribution of data, comprising the steps of:

modeling the complex distribution as a sum of discrete simple distributions; and
processing the simple distributions independently.

[Claim 2] 2. The method of claim 1, wherein the processing step comprises manipulating and interpreting the simple distributions independently.

[Claim 3] 3. The method of claim 1, wherein the modeling step comprises executing an evolutionary algorithm.

[Claim 4] 4. The method of claim 1, wherein the processing step comprises executing an evolutionary algorithm.

[Claim 5] 5. The method of claim 2, wherein:

the interpreting step comprises identifying the simple distributions that are spurious; and
further comprising the step of:
reconstructing the complex distribution by summing the simple distributions that are not spurious.

[Claim 6] 6. The method of claim 1, wherein the complex distribution comprises well logging data generated from measurements of one or more parameters of a subsurface formation.

[Claim 7] 7. The method of claim 6, wherein the well logging data comprises measurements that are representative of one or more natural phenomena.

[Claim 8] 8. The method of claim 6, wherein the well logging data comprises measurements that are representative of one or more physical processes.

[Claim 9] 9. The method of claim 1, wherein the simple distributions comprise one or more statistical distributions.

[Claim 10] 10. The method of claim 1, wherein the simple distributions can each be characterized by a reduced data set.

[Claim 11] 11. The method of claim 10, wherein the simple distributions comprise one or more statistical distributions that can each be characterized by an amplitude, mean, and standard deviation.

[Claim 12] 12. A method for transmitting measured wellbore data from a subsurface location to a surface location, comprising the steps of:

modeling the measured wellbore data at the subsurface location as a sum of discrete simple distributions that are capable of being represented by a relatively small number of parameters;
transmitting the representative parameters from the subsurface location to a surface location; and
reconstructing the measured wellbore data at the surface location using the transmitted parameters.

[Claim 13] 13. The method of claim 12, wherein the simple distributions are statistical distributions.

[Claim 14] 14. The method of claim 13, wherein the statistical distributions are normal distributions that capable of being represented by an amplitude, a mean, and a standard deviation.

[Claim 15] 15. A method of acquiring subsurface formation data, comprising the steps of:

disposing a formation evaluation tool in a wellbore penetrating a subsurface formation of interest;
acquiring formation data with the formation evaluation tool, the acquired data representing a complex distribution;
modeling the complex distribution as a sum of discrete simple distributions; and
processing the simple distributions independently.

[Claim 16] 16. The method of claim 15, wherein the processing step comprises manipulating and interpreting the simple distributions independently.

[Claim 17] 17. The method of claim 15, wherein the modeling step comprises executing an evolutionary algorithm.

[Claim 18] 18. The method of claim 15, wherein the processing step comprises executing an evolutionary algorithm.

[Claim 19] 19. The method of claim 16, wherein:

the interpreting step comprises identifying the simple distributions that are spurious; and
further comprising the step of:
reconstructing the complex distribution by summing the simple distributions that are not spurious.

[Claim 20] 20. The method of claim 16, wherein:

the interpreting step comprises identifying the simple distributions that are spurious; and
further comprising the step of:
mapping the formation about the wellbore as a function of vertical depth according to the simple distributions that are not spurious.

[Claim 21] 21. The method of claim 15, further comprising the steps of:

from a location within the wellbore, characterizing each of the simple distributions with a substantially reduced data set; and
transmitting the substantially reduced data sets to the surface from the wellbore location.

[Claim 22] 22. The method of claim 21, wherein:

the simple distributions comprise one or more statistical distributions; and each of the statistical distributions is characterized by an amplitude, mean, and standard deviation.

[Claim 23] 23. The method of claim 20, further comprising:

repeating the disposing, acquiring, modeling, processing, and mapping steps with respect to one or more further wellbores penetrating the subsurface formation; and
mapping the formation between the wellbores by interpolating between the respective wellbore-formation maps.

[Claim 24] 24. A method for acquiring subsurface formation data, comprising the steps of:

conducting logging operations in a plurality of wellbores penetrating a subsurface formation of interest so as to acquire a plurality of formation data sets, each of the acquired data sets representing a complex distribution;
modeling each of the complex distributions as a sum of discrete simple distributions; and
processing the simple distributions independently.

[Claim 25] 25. The method of claim 24, wherein the processing step comprises interpolating the simple distributions over the area between the plurality of wellbores so as to generate a 2D or 3D map of the simple distributions over at least a portion of the formation.

[Claim 26] 26. The method of claim 25, wherein the simple distributions are each representative of a specific formation property.

[Claim 27] 27. An apparatus for acquiring subsurface formation data, comprising:

a formation evaluation tool adapted for acquiring formation data while disposed in a wellbore penetrating a subsurface formation of interest, the formation data representing a complex distribution;
means for modeling the complex distribution as a sum of discrete simple distributions; and
means for independently processing the simple distributions to identify the simple distributions that are spurious.

[Claim 28] 28. The apparatus of claim 27, further comprising:

means for reconstructing the complex distribution by summing the simple distributions that are not spurious.

[Claim 29] 29. The apparatus of claim 27, further comprising:

means operatively connected to the formation evaluation tool for characterizing each of the simple distributions with a substantially reduced data set; and

means operatively connected to the formation evaluation tool for transmitting the substantially reduced data sets to the surface from the wellbore location.

[Claim 30] 30. The apparatus of claim 29, wherein:

the simple distributions comprise one or more statistical distributions; and

each of the statistical distributions is characterized by an amplitude, mean, and standard deviation.